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Coal Extraction Underneath Surface Features & Structures: Harmonious Mining Seminar at CMRS

view of the fact that more than 1500 llion tonnes of coal await exploitation seams lying underneath buildings, lages, railway lines, rivers, etc. and o because only limited efforts have en made so far to extract such coal ams the Central Mining Research ation (CMRS), Dhanbad, in col- poration with the Bharat Coking Coal d (BCCL), organized the seminar, on 5 ctober 1980, to formulate the future urse of action. Forming part of silver ilee celebrations of CMRS, the minar was attended by about 200 legates from organizations like Steel uthority of India Ltd, Tata Iron & eel Company Ltd, Indian Iron & Steel mpany Ltd, Indian School of Mines, stern Coalfields Ltd, Central alfields Ltd, Western Coalfields Ltd, d M.B.M. Engineering College dhpur). Twelve papers dealing with fferent aspects of coal extraction derneath surface features and struc- res and harmonious mining were esented in three technical sessions.

A steering committee formed to scuss the follow-up action on the roceedings of the seminar called for rge-scale and systematic subsidence bservations. In view of the wide versity in geotechnical characteristics, e committee observed, extrapolation overseas experience was not wise. udies should be conducted under fferent geological and geotechnical vironments of different coalfields in rgin and worked-out areas to generate meaningful data on subsidence factor, limit angle, magnitude of ground strains, etc. These data could be utilized for maximizing recovery through improved designs of exploitation systems.

The problems of safety as obtaining in Jharia, Raniganj, Barakar, Kulti and other towns in the coalfields, where the legacy of past exploitation poses problems of stability, call for large-scale and urgent stabilization programmes, the committee observed.

The committee further recommended that the large-scale assessment of subsidence damages in coalfields was required to be undertaken to correlate the mining parameters with the acceptable criteria of damages. It also recommended that a committee at the national level should be set up to identify and assess the problems of subsidence and to delineate the priority areas of research.

The CMRS's Acting Director, Dr B. Singh, in his welcome address, highlighted the three approaches being adopted by his laboratory for promoting the extraction of seams from underneath surface features and structures: (i) field investigation to collect data pertaining to subsidence and ground movement parameters over caved and stowed workings with a view to developing a harmonious mining system; (ii) mine pillar designing for partial extraction; and (iii) equivalent material mine modelling approach to predict ground behaviour. He added that CMRS had further intensified its R & D activities in this direction and basic ground data on ground movement as well as surface subsidence were being collected for an in-depth study.

Outlining the sixth five-year plan programmes of CMRS, Dr Singh pointed out that the laboratory aimed at concentrating its R & D activities on 19 major projects and 52 minor projects.

BCCL's Chairman-cum-Managing Director, Shri R.C. Mahendru, who also spoke on the occasion, was of the view that CMRS and coal companies should jointly undertake long-term R&D work. □

Design and Construction of Offshore and Marine Structures: SERC Course

For the benefit of senior engineers engaged in the design and construction of ports, harbours, and other marine structures, a course on 'Design and construction of offshore and marine structures' was conducted at the Structural Engineering Research Centre (SERC), Madras, from 27 to 30 January 1981. The participants were exposed to the various aspects of marine concrete, piling and pile driving, port and harbour construction, coastal structures, and offshore structures, including maintenance. The offshore structures covered included terminals and platforms for oil and gas production.

Prof. Ben C. Gerwick (Jr), Professor of Construction Engineering and

Inside

Glass Fibre Roving Impregnating Machine: NAL .. 26

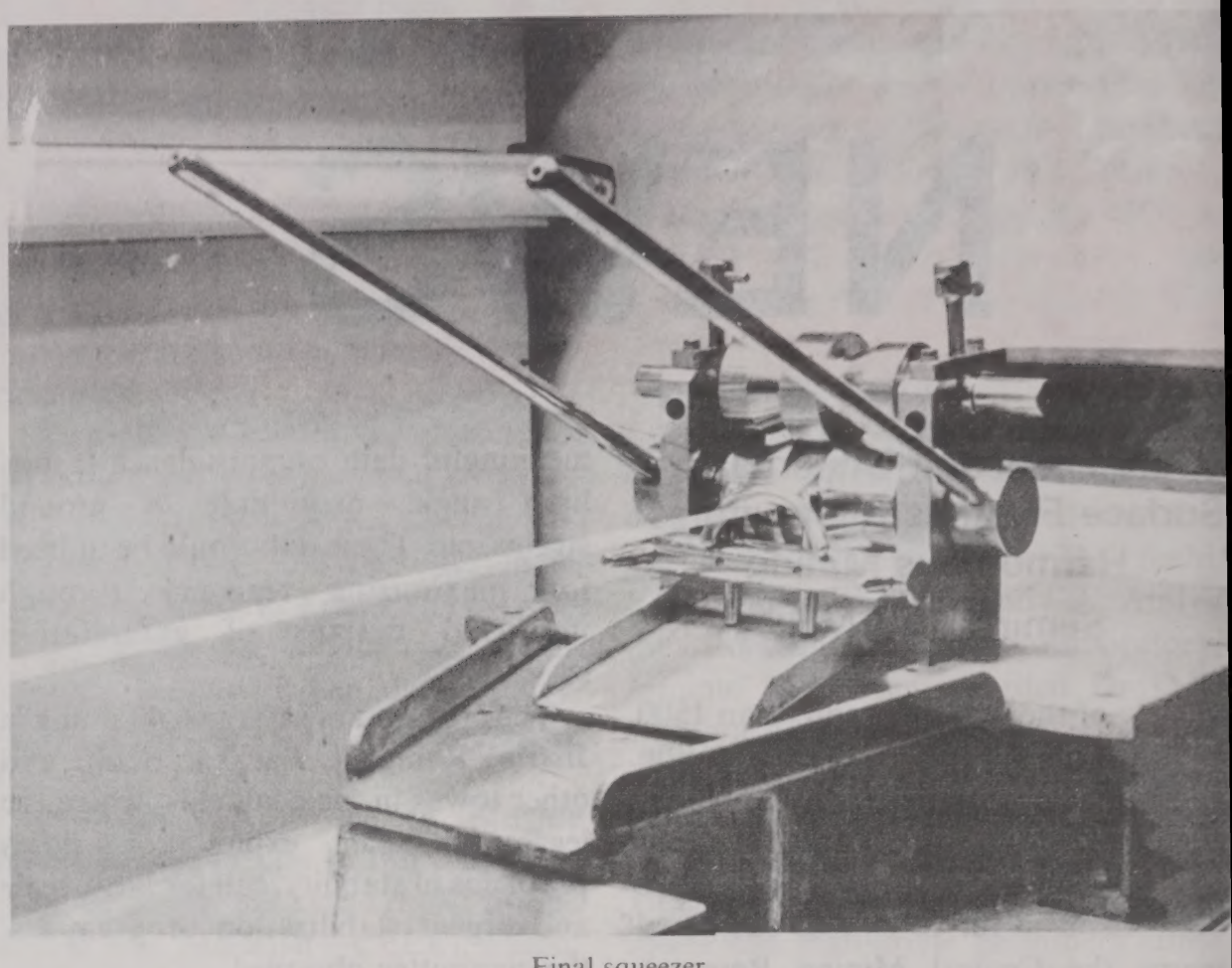
BHATNAGAR PRIZEWINNER'S WORK

Prof. P.R. Adiga: Carrier-Proteins and Vitamin Transport Across the Placental Barrier .. 27

Dr D.J. Mehta & Dr G.S. Sidhu Retire .. 31

Management, University of California, Berkeley, USA, was the principal faculty member of the course. The services of Prof. Gerwick, a well-known authority on marine and off-shore construction, were made available by UNDP/UNCHS as part of the aid which SERC is receiving from UNDP. Scientists from SERC and experts from Oil & Natural Gas Commission, Ministry of Shipping & Transport, Bombay Port Trust, National Institute of Oceanography, Goa, and Indian Institute of Technology, Madras, constituted the other members of the faculty.

The course, which comprised 17 lectures and a group discussion, was attended by 24 participants including two from abroad. □

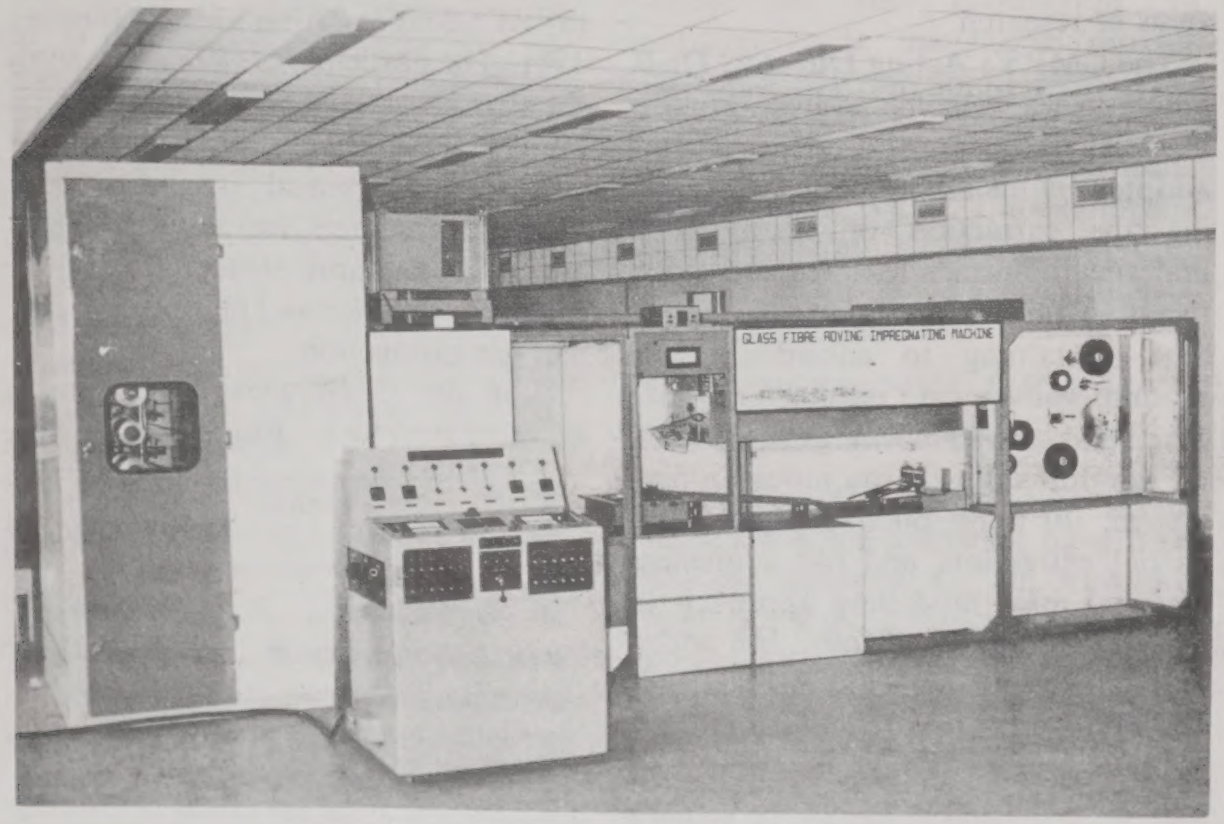


Final squeezer

Glass Fibre Roving Impregnating Machine

The National Aeronautical Laboratory (NAL), Bangalore, has designed and developed a fibreglass epoxy resin impregnating tape manufacturing machine for use by the Advanced Light Helicopter Division of the Hindustan Aeronautics Ltd. The machine has been designed to produce unidirectional composite tapes at the rate of 6 m/min to facilitate fabrication of helicopter blades and various fighter aircraft components.

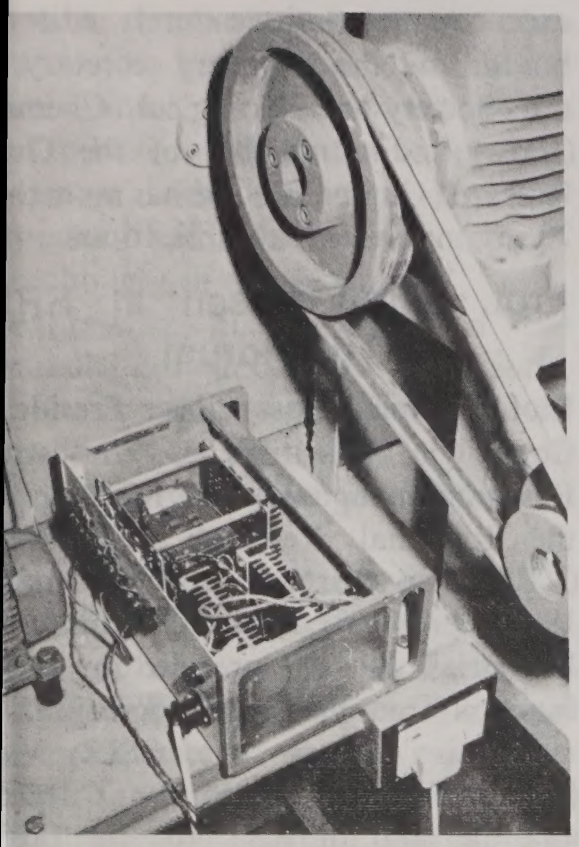
The machine comprises fibre storage, impregnation, and reel-off zones. At one end the machine houses the fibre storage zone maintained at a very low temperature and relative humidity to prevent the deterioration of fibre properties. All the bobbins in this zone are provided with individual electropneumatic control systems for effecting proper tension control on the fibres. In the unlikely event of fibre breakage any of the numerous microswitches installed along the fibre path could bring the machine to a halt.



Glass fibre roving impregnating machine

The next zone, where impregnation of fibres in the epoxy resin-hardener mixture takes place, comprises a peristalitic pump, an electronic temperature controller and a carbon dioxide gas system. This system ensures that the process of impregnation is carried out under optimum conditions without any air entrapment. The fibre just after impregnation passes under a series of infrared heating lamps, thereby allowing the resin to flow and wet the fibres completely. A system of eccentric shaft mounted squeeze rollers is planted at the end. The system configuration controls the glass-to-resin ratio to 79 : 21 by weight, the width of the tape to 25 mm and the thickness to 0.8 mm with a high degree of accuracy and consistency.

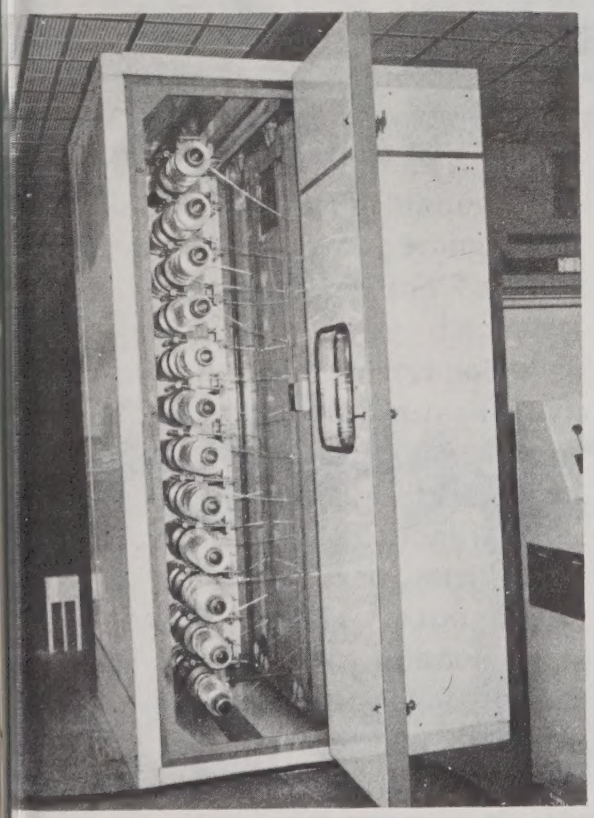
The tacky tape then enters a reel-off zone incorporated with numerous



osed-loop feedback control system for the reel-off spool

ollers—most of them idlers and each ne in its own way aiding the tape to be ulled efficiently. For instance, a rooved roller mounted on the shaft of a eduction gear 3 hp induction motor ystem is flanked by two idlers whose ositioning is such as to induce aximum friction between the tape and ne pulley and to utilize the greatest action of the motor torque for pulling ne tape. The reel-off spool is mounted the other extreme of the machine to take up the uncured composite sandwiched between polythene tapes supplied from spools placed on either side. Microswitches on the way of the polythene tapes do not allow the machine to be operated if these tapes are not interposed. As the products get wound on to the reel-off spool the instantaneous diameter increases and to maintain the constant linear velocity the reel-off motor speed has to be varied hyperbolically. This is attained by an electronics closed-loop feedback control system coupled to a dc motor which drives the reel-off spool.

The unidirectional laminates made with these tapes have shown good ultimate tensile strength, modulus of elasticity, etc. comparable with those obtained by SNIAS, France. □



Fibre storage system

CARRIER-PROTEINS AND VITAMIN TRANSPORT ACROSS THE PLACENTAL BARRIER

BHATNAGAR PRIZEWINNER PROF. ADIGA'S WORK*

The most significant achievement of Prof. Adiga is his discovery of the phenomenon of the carrier-protein-mediated delivery mechanism for the two water-soluble B-group of vitamins, viz. riboflavin and thiamin, for transport across the placental barrier to subserve foetal development in mammals like the rodents. The two

reproduction-specific vitamin-carrier proteins, with paramount functional importance in embryonic survival, were purified for the first time, and specific assay methods were developed for monitoring their circulatory levels in the mother. The female sex hormone estrogen was identified as being responsible for their induction in the maternal liver. More importantly, Prof. Adiga has unequivocally demonstrated that immunological interference with their function during pregnancy would severely and selectively curtail vitamin supply to the foetus, leading to profound foetal wastage and abrupt termination of pregnancy. Since the maternal well-being in terms of growth, vitamin status and endocrine functions are unaffected under these conditions, these findings herald a novel and potentially useful approach to medical termination of pregnancy/contraception and hence to family planning.

The exciting researches of Prof. Adiga and his associates on vitamin-carrier proteins were done with the egg-laying species like the chicken (used as a model system) which have an obligatory requirement for storage of all essential nutrients, including B-group of vitamins, in their eggs in adequate quantities for proper development of the prospective embryos. These studies have led to the isolation and characterization of the two carrier-proteins, one specific for riboflavin and the other for thiamin, by conventional methods of protein purification as well as by the novel methods of affinity chromatography. Specific induction of these proteins by estrogen administration in experimental animals, the physicochemical basis of their high-affinity interaction with respective vitamins in 1:1 molar ratio, hormonal modulation and interactions involved in the induction processes, the production of specific antibodies and the development of sensitive radioimmunoassays for the

*Prof. P.R. Adiga of the Department of Biochemistry and U.G.C. Centre for Advanced Study, Indian Institute of Science, Bangalore, has been named (jointly with Prof. T. Desiraju) recipient of Shanti Swarup Bhatnagar Prize for 1980 in medical sciences. [*CN*, 31 (1981), 1].

proteins were accomplished with meticulous care. The major breakthrough came with the use of the specific antibodies to these carrier-proteins to detect the presence of similar functionally-active proteins in the pregnant rat sera. With the discovery of such proteins in a mammal for the first time, emphasis shifted to isolating them from pregnant rodents and primates and to studying their functionality. Prof. Adiga showed that these proteins are absolutely essential for transplacental transport of the vitamins to meet the requirement of rapidly growing foetus since administration of antibodies to these proteins resulted in the tieing up of all the carrier-proteins (along with their firmly-bound vitamins) and the normal vitamin status of the mother could not prevent the occurrence of abortion following acute foetal wastage due to vitamin deficiencies. This essentially shows that the vitamins have to be delivered in a carrier-protein-bound form for them to be efficiently transferred across the placental barrier. More exciting results obtained recently in Prof. Adiga's laboratory have added a new dimension to these findings. The female animals of proven fertility, but immunized against the carrier-proteins, conceived normally on mating, but the moment the placentation took place, their early pregnancies were abruptly terminated in 100% of the cases without any adverse effects on the maternal health.

These findings imply that: (1) in addition to satisfactory maternal vitamin supply during pregnancy adequate, efficient and specific delivery systems (carrier-proteins) ultimately determine the foetal vitamin nutrition and hence its development; (2) a possible explanation for some of the ill-defined causes of foetal wastage/premature death/teratogenesis may be attributable to genetic and endocrine defects in the production and/or functionality of these vitamin-carriers; (3) during pregnancy, estrogen has a new, important role in foetal nutrition, in terms of induction of the carrier-proteins in the mother so that they could ensure delivery of sufficient vitamins to the foetus; and (4) immunological interference with these proteins may be exploited as a new, potentially useful approach to medical termination of pregnancy/contraception.

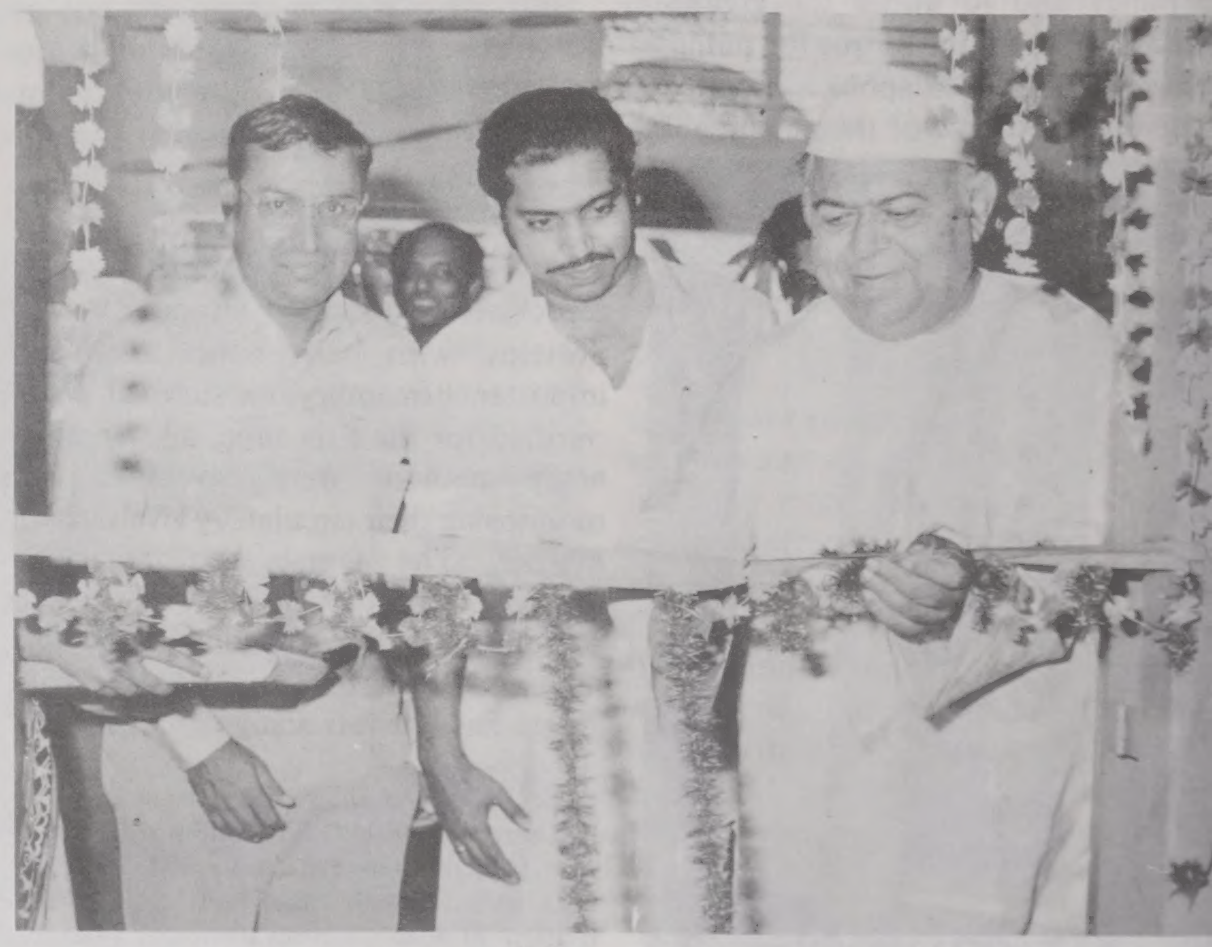
Prof. Adiga has also made other significant contributions to biochemistry and molecular endocrinology.

Prof. Adiga (born 5 May 1935) obtained his B. Sc. (Hons) and M. Sc. degrees in chemistry from the University of Kerala, Trivandrum, and his Ph. D. in biochemistry from IISc under the supervision of the late Prof. P. S. Sarma. He did his postdoctoral research with Prof. T. Winick at the University of Hawaii Medical School, Honolulu, Hawaii, USA (1963-67), and with Prof. J. M. McKenzie at the Department of Medicine, McGill University and Royal Victoria Hospital, Montreal, Canada (1967-69) where he obtained his early training in endocrine biochemistry. He joined IISc in 1970 as a senior research fellow and rose to the positions of Lecturer (1970), Assistant Professor (1973) and Associate Professor (1978). Prof. Adiga has been a member of the executive committee and ed board, and the honorary secreta the Society of Biological Ch (India) and a member of the Research Conference. He has mor 70 original research publications.

Prof. Nurul Hasan at R Trivandrum

Prof. S. Nurul Hasan, Vice Presi Council of Scientific and Indu Research, inaugurated the first flo the Regional Research Labora (RRL), Trivandrum, on 29 Decen 1980. Shri P. C. Chacko, Ministe Industries, Kerala, presided over function organized on the occasion

In his address, the CSIR President complimented the Dire and the staff of RRL for the ra progress the laboratory had made both infrastructure and project wo especially relating to the material ne of the region. Prof. Hasan added t there was need to look at the utilizati of the human resource as well. Referri to the generation of employme resulting from industrialization, emphasized that employment should of good quality, and must assure



Prof. S. Nurul Hasan inaugurating the new floor of RRL-Trivandrum

equate standard of living. Another a to be taken note of was the servation of the environment and the d to have a total systems approach. noted with satisfaction that the oratory had already given appropte thought in this direction.

Expressing his pleasure in the ntinued growth of CSIR in the state, e Kerala minister hoped that, in the ars to come, this laboratory would ay a major role in the industrialization Kerala.

In his welcome address, Prof. P. K. hatgi, RRL's Director, gave a brief sume of the growth of the laboratory d highlighted the progress in some of e major research projects relating to ices, food technology, fibres, clay, etallurgical application, energy, techlogy forecasting, and management. □

Conference Briefs

FID/CAO General Assembly

ri A. Krishnan, Scientist in charge, ndian National Scientific ocumentation Centre (Insdoc), New elhi, participated in the sixth general ssembly of the Commission for Asia nd Oceania (CAO) of the International ederation for Documentation (FID) eld at Gokushi Kaikan (Science ouncil), Tokyo, on 6-7 November 980. Eleven delegates from seven ountries, besides one representative om FID and four observers from the ost country Japan, attended the eeting at which country reports on the evelopment of documentation activities from Australia, Hong Kong, India, ndonesia, Japan, Korea and Thailand ere presented and discussed. pplication of computer technology in formation services was one of the mportant developments reported, reorts Shri Krishnan. Significantly, apan's information technology has, like er other industrial developments have, een shaped largely through her dvances in electronics technology, as evealed in one of the four papers resented by the Japanese delegates. What is equally noteworthy is that the apanese information system is the central motivating power for most of the national developments.

Another important development reported at the general assembly, according to the CSIR delegate, was that South Korea has implemented through KORSTIC, counterpart of Insdoc in that country, the ASCA information registry. This was in pursuance of one of the recommendations of the seventh meeting of the Association for Science Cooperation in Asia (ASCA) (Soeul, 1979) for establishing an institutional mechanism for continuous and effective exchange of information between member countries on the national science and technology development policies and experiences.

Shri A. Krishnan, who also represented India, presented the Country Report on Information Services and Documentation Activities in India during the last two years. The report dealt with: Management in information science at national and international levels; Communication methodology; User aids; Translation; Standardization in information science; Sectoral information; and International and national cooperation.

The Committees on Industrial Information and Agriculture presented their reports and indicated that they would release shortly directories of information sources in the region in their respective areas.

To study the science information system in Japan Shri Krishnan visited: Japan Information Centre for Science and Technology, Japan Atomic Energy Research Establishment, Japan Patent Information Centre, National Diet Library, and United Nations University Information Centre.

Shri Krishnan observes that Japan's plan for networking information system is similar to NISSAT in India. □

PROGRESS REPORTS

CECRI Annual Report: 1979-80

The annual report of the Central Electrochemical Research Institute (CECRI), Karaikudi, for 1979-80, published recently, reveals that as many as 72 processes developed by the laboratory had been transferred to industry (as of 31 March 1980); 46 processes were ready for release. The processes released through the National Research Development Corporation of India (NRDC) during the period covered under the report relate to: sodium, potassium and ammonium perchlorates, calcium gluconate, aluminium lithoplates, calcium silicide, lacquer for corrosion prevention, and coatings of corrosion prevention in reinforced concrete construction. The following processes were assigned to NRDC for release to interested parties: inhibitor formulation for cooling water; trisodium phosphate for chemical phosphating of ferrous items; manganous chloride; manganous sulphate; low temperature zinc phosphating formulations; noncyanide chemical stripper for removal of defective nickel and copper deposits from iron/steel substrates; ammonium persulphate; zinc phosphate; zinc sodium silicate primer; and zinc-rich organic primer. Two processes, one relating to the manufacture of *p*-aminobenzoic acid and the other to dry cells, went into production.

Consultancy services were rendered on: Corrosion protection of sheet steel piles in building/repair docks at Cochin shipyard; Protection of steel structures under wet and dry conditions at Tuticorin New Port; Processing of spent catalyst for recovery of metal values, to Shri Ram Chemicals, Ahmedabad; and Studies on corrosion of ACSR conductors, hardware and line supports under severe chemical pollution, to Maharashtra State Electricity Board. A sponsored scheme on the preparation of perchloric acid was also completed.

About 4.5 tonnes of magnesium metal produced at the institute's pilot plant was supplied to interested parties.

The institute has developed a formulation which when added to cooling water can inhibit the corrosion of industrial cooling systems. The estimated demand for the inhibitor is worth Rs 10 million; no indigenous

know-how was available for its manufacture.

Employing trisodium phosphate, a cheap commercially available material, the institute has developed a chemical phosphating process. Phosphating improves the adhesion of paint to the steel base and thus improves its corrosion resistance.

A process has been developed for the preparation of manganous chloride tetrahydrate on a large laboratory scale by reducing the manganese ore in a furnace with reductants like charcoal, coke, fuel oil or natural gas. The reduced ore is then dissolved in commercial hydrochloric acid and the manganous chloride solution thus prepared is purified and crystallized. The chemical finds application as an industrial catalyst, as a dryer in paint, in the manufacture of brown pigments, in printing and dyeing of textiles, in the production of solar cells, etc.

Similarly, by dissolving the reduced manganese ore in sulphuric acid in place of hydrochloric acid, the institute prepared manganese sulphate monohydrate. The sulphuric acid solution had to be kept near neutral condition to eliminate impurities. The sulphate finds application as micronutrient in agriculture and animal feed, as starting material for the manufacture of other manganese compounds, and as fungicide in industries dealing with glazes, pottery, textile dyeing, etc.

An electrolytic process for the preparation of ammonium persulphate has been worked out. In this process, the pure product can be obtained in a single step. Ammonium persulphate finds application in rubber, plastic and textile industries, and it has now a demand of the order of 300 tonnes/annum.

The laboratory has formulated a noncyanide stripping additive mixture for removing defective electro-deposits by a simple immersion of the rejects in a solution. This solution is suitable for removing nickel and copper electro-deposits on iron/steel. The substrate obtained by employing the stripper developed needs no repolishing and can be taken straight through the plating sequence.

An improved process has been developed for the preparation of zinc phosphate, which consists in reacting stoichiometric quantities of zinc carbonate and orthophosphoric acid. The advantages of the process are: it is simple and safe and is free from effluent and pollution problems; also, no external heating is necessary in the process. Primers containing zinc phosphate are not toxic and they promote excellent intercoat adhesion, particularly under high humidity. The institute has also worked out: (i) a zinc based low temperature phosphating formulation for carrying out phosphating at temperatures of 25-30°C within a period of 10-15 min, and (ii) a process for manufacturing zinc sodium silicate and zinc-rich organic primers.

Twenty-five research papers and 1 review articles were published; 1 patents were filed and five patents sealed. □

PROCESSES AND PRODUCTS READY FOR COMMERCIAL UTILIZATION

Dissolved Oxygen Analyzer

For measuring dissolved oxygen in water, effluents, etc. the Central Scientific Instruments Organisation (CSIO), Chandigarh, has developed a device. The quantity of dissolved oxygen is an important parameter, to be determined and controlled, in such applications as discharge of industrial effluents, water treatment for boilers, and fermentation where this device can find good use. Also, other applications like sewage treatment/disposal, and biological requirements for growth of fish require the use of suitable dissolved oxygen analyzers.

The analyzer developed by CSIO is based on polarography principle. Its sensor consists of a gold electrode, a silver anode and a thin semipermeable membrane. This, along with the liquid in which oxygen is in dissolved state, forms the complete system for the measurement. The oxygen in the liquid gets reduced at the cathode, the current arising from the resultant electrons is amplified by a current amplifier, and a meter is used to indicate the quantity of dissolved oxygen.

The laboratory has fabricated three instruments all of which have been found to give satisfactory performance.

The components required for fabricating the device are: integrated circuits, resistors, potentiometers, transformers, switches, Teflon membrane, gold/silver probes, capacitors, diodes, transistors, IC bases, PCBs, and meters. Except ICs, which are of imported origin, all are available indigenously.

Since this is an assembly-oriented product, production mechinery required is not significant. Test equipment needed are: digital multimeter, avometer, constant temperature bath, refrigerator, heating mantles, magnetic stirrer, and aerator. For calibration, oxygen-free nitrogen gas, de-ionized water, chemical laboratory glassware, and chemicals are needed, and all these are available indigenously.

The specifications of the oxygen analyzer designed and developed by CSIO are as follows:

Range	:	0–5; 0–10; 0–20 ppm
Accuracy	:	±0.3 ppm
Response time	:	depends on membrane thickness; with 0.5 ml membrane, 90% response can be obtained in 45 s
Temp. compensation	:	manual, 10°-50°C

The demand for the instrument, as estimated by CSIO, is 100 pieces per annum. Since the demand is low, it is preferable that an entrepreneur in a related line of manufacture takes on this product as an additional item. A fixed capital of Rs 35,000 (excluding land and building) and a working capital of Rs 45,000 are needed for fabricating about 60 pieces per annum. The capital required will however depend on the facilities already available with the entrepreneur.

The terms for transfer of know-how : lump sum premium, Rs 6000; urring royalty, 3%; nature of licence, n-exclusive; and period of licence, 5 ars.

The process (NRDC Process No. 7.10.80) is available through the ational Research Development Cor- ration of India (61 Ring Road, Lajpat agar III, New Delhi 110024) from nom further details may be tained. □

EXTRAMURAL RESEARCH

Microdetermination of Copper in Biological Systems

opper plays a very important role in e life processes both in the animal and the plant kingdom. In humans, wering of serum copper level indicates ther insufficient dietary intake or a thologically increased excretion of pper as in anaemias of children, ephrotic syndrome or Wilson's disease. ise in serum copper level results in rrhosis of liver in pregnancy. In enke's disease, accumulation of pper in some tissues leads to fatal eficiencies in the other. The de- rmination of copper in blood serum n therefore be of diagnostic impor- nce. With this objective in view, a SIR postdoctoral fellow, Miss U.D. gadale (*alias* Smt Usha S. Deshmukh), ho worked at the Department of hemistry, Shivaji University, ohlapur, has developed a sensitive ethod for the determination of copper blood. The copper in the blood serum deproteinated by the usual method d the deproteinated serum is treated th 6-nitroquinoxaline-2,3-dithiol. ne copper complex formed at *p*H 0.7 is tracted with iso-amyl alcohol and easured photometrically at 640 nm. ne method is more sensitive than the therto reported methods, repro- acible and simple.

Not much attention has been paid, in dia, to the determination of copper quirements of crops. Deficiency of pper in crops leads to lowering of elds, whereas overdoses, either from acid soils or from heavy application of bordeaux mixture, lead to chlorosis. The research fellow has also worked out a method for the determination of copper in plants. The method: Dried samples of the plant material are wet-ashed and the copper content of the solution is determined, photometrically, after extracting the copper complex of 6-nitroquinoxaline-2,3-dithiol with iso-amyl alcohol. □

PATENTS FILED

842/Del/80: Improvements in the process for manufacture of copper ruby glass article, S.N. Prasad, S. Sensarma & S.K. Gupta—CGCRI, Calcutta.

PERSONNEL NEWS

Retirements

Dr D.J. Mehta

Dr Dhirajlal Jethalal Mehta, the fourth Director of the Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar, retired on superannuation on 31 December 1980.

During his stewardship, the institute made significant progress in all its areas of work, viz. salt, marine and inorganic chemicals; desalination through reverse osmosis and electrodialysis techniques; marine algae; sea water irriculture; and solar energy utilization. Dr Mehta's contributions in reverse osmosis are noteworthy. Besides, he had been associated with projects concerning sea water magnesia and silicates.

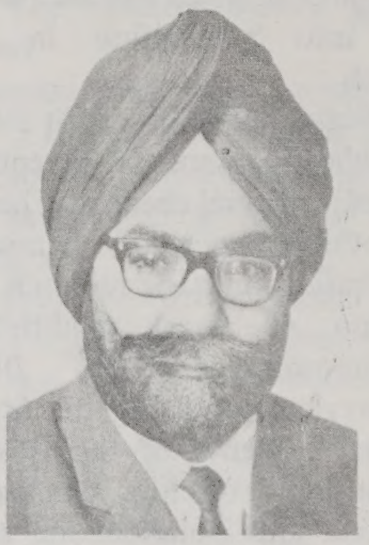
Born in 1920, Dr Mehta graduated from the University of Bombay and obtained master's and doctorate degrees in chemical engineering from USA. Joining CSMCRI in 1954 as Junior Scientific Officer, he rose to the position of Director in 1975.

Dr Mehta has to his credit over 85 research publications and seven patents of which six have been under commercial production. Recipient of the National Research Development Corporation of India's invention awards for his process on hydrated calcium silicate and for the development of tubular reverse osmosis plant, he has also won the Federation of Gujarat Mills & Industries Association Award and the Hari Om Ashram Award for developing the tubular reverse osmosis plant.

Dr Mehta went to USA under NSF-CSIR exchange programme in 1969-70 and visited important test facility centres for desalination under the Office of Saline Water Conversion, Department of Interior. He also led an Indian delegation to USSR for exploring cooperation between India and the Soviet Union for utilization of alternative sources of energy in general and solar energy in particular. □

Dr G.S. Sidhu

Dr G.S. Sidhu, Director, Regional Research Laboratory, Hyderabad, retired on 31 January 1981. The pre-eminent position which this laboratory holds among the R&D institutes in the



country is largely due to the dynamic leadership provided by him as its director since 1963. Providing a proper environment for pursuit of research in his laboratory and bringing to bear modern management techniques on the

conduct of R&D are his other equally important contributions.

Under his stewardship the laboratory contributed greatly to achieving self-sufficiency in many areas of chemical technology. In areas of special interest to him, namely industrial organic chemicals, drugs and pharmaceuticals, pesticides and wood chemistry, Dr Sidhu's contributions need special mention. These include, for instance: enphenamic acid (Tromaril), a new anti-inflammatory drug discovered and developed by the laboratory and being marketed by Unichem Laboratories, Bombay; organic intermediates like benzyl chloride, benzyl alcohol, benzyl acetate, phenylacetic acid and phenyl acetamide the development of whose know-how has contributed to self-sufficiency in respect of these chemicals in the country; and pesticides like monocrotophos, MBC, Diazinon, DDVP, Methoxychlor and Tedion, which are in great demand in the country and which will be commercially produced on the basis of RRL know-how. Just one more instance to illustrate the measure of success Dr Sidhu has achieved in getting the results of research effectively transferred to industry is the Rs 125 million, 900 tonnes low temperature coal carbonization plant for production of domestic fuel from coal, which has been set up and gone into production in Andhra Pradesh.

Dr Sidhu has to his credit more than 80 publications and 50 patents in the fields of medicinal chemistry, heterocyclic synthesis and wood chemistry. His contributions in basic research include: isolation of novel naphthols and naphthoquinones from *Diospyros melanoxylon*, providing the first experimental evidence of their biogenetic relationship; structure elucidation of diospyrin and isolation and structure elucidation of isodiospyrin and xylospyrin, the only trisnaphthoquinone isolated so far.

Born in 1920, Dr Sidhu took his M.Sc. (1941) and Ph.D. (1949) degrees from the Lucknow University. He did postdoctoral work at Chemistry Institute, University of Heidelberg, Pregl Laboratory and Institute of Medicinal Chemistry, Graz; and Institute of Chemistry of Foodstuffs at the Technical University, Graz, Austria.

Recipient of Padma Shri (1976), Dr Sidhu has also won Federation of Indian Chambers of Commerce & Industry's Award (1975) and K.G. Naik Gold Medal (1966). He was chairman of the coordination council for the chemical sciences group of CSIR laboratories (1975-77).

Dr Sidhu has recently taken up the chairmanship of the board of directors of the National Research Development Corporation of India. □

Dr C.K. Atal

Dr C.K. Atal, Director, Regional Research Laboratory, Jammu, has been appointed chairman of the coordination council for the biological sciences group of CSIR laboratories for a period of two years with effect from 18 January 1981, in place of Dr Nitya Nand, Dir Central Drug Research Inst Lucknow.

Administrative Manager Workshop

The CSIR's Centre for Management will be organizing a week workshop on Administrative Management sta from 16 March 1981 at the Reg Research Laboratory, Hyderaba junior administrative personnel of laboratories in the southern and we regions. A limited number of pe from outside CSIR will also accommodated. However, institut nomination is essential. The co contents will be: Organization dev ment, Personnel management service conditions, O & M, Finances and materials manager Interested persons may get fu details from: Shri S.R. Vasist, Trai Officer, CSIR Headquarters, Rafi M New Delhi 110001.

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARC

Advertisement No. 3/81

It is proposed to appoint one Scientist 'F' (Deputy Director) at the Central Food Technological Res Institute, Mysore.

Job requirements: This is a senior R&D management position. The incumbent will be responsib the planning, execution and coordination of various research projects of the institute in the ar chemistry and technology of agro-foods and processing of grains and carbohydrate materials. He sh be able to command the confidence of research workers in his field and be an able administrato image builder of the institute. He will be expected to provide assistance to the Director i management of the institute and to interact with other organizations and public bodies.

Qualifications: High academic qualifications in chemistry/biochemistry/related areas of techno preferably a Ph.D. and a consistently good academic career. Outstanding record of R&D in the fie specialization and familiarity with modern techniques of research with evidence of research publicat monographs, patents, etc. At least 10 years' experience in a responsible position in an R&D organiz with proven ability.

Salary/Conditions of service: The salary scale attached to the post is Rs 2000-125/2-2500. Initia will be fixed according to merit. The person selected will be appointed on contract for a period years, which would be confirmed after an initial period of two years of satisfactory service. conditions of contract will be supplied on request. Qualifications and experience are relaxable in the of candidates otherwise found suitable for the post.

Age limit: Below 50 years, relaxable in special cases.

Scientists/technologists interested may obtain two copies of the standard proforma, for sending *curriculum vitae*, from the Chief (Administration), Council of Scientific & Industrial Research, Marg, New Delhi 110001, on or before 6 March 1981. They can also obtain a brochure on the aim objects and the latest annual report of the laboratory. Completed *curriculum vitae* proforma mu received in this office on or before 6 April 1981.

Canvassing in any form and/or bringing in any influence, political or otherwise, will be treated disqualification for the post.

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